any combination of methods (or processes) disclosed in this application as relevant to any embodiment of the invention, and/or at least one signal resulting from one or any combination of methods (or processes) disclosed in this application as relevant to any embodiment of the invention.

[0011] In various example embodiments, the methods (or processes) can be accomplished on the service provider side or on the mobile device side or in any shared way between service provider and mobile device with actions being performed on both sides.

[0012] For various example embodiments, the following is applicable: An apparatus comprising means for performing the method of any of originally filed claims **1-10**, **21-30**, and **46-48**.

[0013] Still other aspects, features, and advantages of the invention are readily apparent from the following detailed description, simply by illustrating a number of particular embodiments and implementations, including the best mode contemplated for carrying out the invention. The invention is also capable of other and different embodiments, and its several details can be modified in various obvious respects, all without departing from the spirit and scope of the invention. Accordingly, the drawings and description are to be regarded as illustrative in nature, and not as restrictive.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] The embodiments of the invention are illustrated by way of example, and not by way of limitation, in the figures of the accompanying drawings:

[0015] FIG. **1** is a diagram of a system capable of temporal registration of modifications in a DOM and providing an efficient update to a DOM, according to an embodiment;

[0016] FIG. **2** is a diagram of components of a proxy platform for registering modifications in a DOM and providing partial updates, according to an embodiment;

[0017] FIGS. **3** and **4** are flowcharts of various processes for, at least, temporal registration of modifications in a DOM and providing an efficient update to the DOM, according to various embodiments;

[0018] FIG. **5** is a time-sequence diagram depicting a traditional process for providing a DOM to a proxy client, according to an example;

[0019] FIGS. **6** and **7** depict various processes for providing a partial DOM update to a proxy client, according to various embodiments;

[0020] FIG. **8** is a diagram depicting a DOM comparison for performing partial updates, according to an embodiment;

[0021] FIG. **9** is a diagram of hardware that can be used to implement an embodiment of the invention;

[0022] FIG. **10** is a diagram of a chip set that can be used to implement an embodiment of the invention; and

[0023] FIG. **11** is a diagram of a mobile station (e.g., handset) that can be used to implement an embodiment of the invention.

DESCRIPTION OF PREFERRED EMBODIMENT

[0024] A method and apparatus for temporal registration of modifications in a DOM and providing an efficient update to the DOM are disclosed. In the following description, for the purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of the embodiments of the invention. It is apparent, however, to one skilled in the art that the embodiments of the invention may be

practiced without these specific details or with an equivalent arrangement. In other instances, well-known structures and devices are shown in block diagram form in order to avoid unnecessarily obscuring the embodiments of the invention.

[0025] Although various embodiments are described with respect temporal registration of modifications in a DOM and providing an efficient update to the DOM within a wireless network environment, it is contemplated that the various embodiments of the approach described herein may be used within any type of communication system or network and with any mode of communication available in the network (e.g., data communications, Internet communication, voice communication, text communication, etc.) In addition, although the various embodiments are further described with respect to mobile devices, it is contemplated that the various embodiments are applicable to any type of device with network access (e.g., stationary terminals, personal computers, etc.)

[0026] FIG. **1** is a diagram of a system capable of temporal registration of modifications in a DOM and providing an efficient update to a DOM, according to an embodiment. As discussed previously, users may utilize a variety of devices for accessing and interacting with web contents that may be available from various online service and content providers, where in many cases the devices are various mobile devices (e.g., tablets, mobile phones, etc.) that provide access to the web contents via wireless communication services. However, implementing mobile web services within a wireless environment can potentially tax the relatively limited resources (e.g., bandwidth, processing power, memory, battery power, etc.) that are available within the environment (e.g., within a mobile device). Moreover, as web-based applications become more sophisticated by employing the latest web technologies (e.g., scripting via languages such as JS), the problem of having sufficient resources at mobile devices to support new applications also increases. One traditional way to address this problem is use of a proxy web browser. By way of example, in a proxy browser, a user's (client's) interactions with web contents, e.g., in a DOM, may be sent to a server where the appropriate actions are taken (e.g., process a request for an updated content item) and new or modified content is sent back to the client device for display. Further, in using a standard browser rendering engine, a challenge to produce a DOM is that a standard browser is designed to return only full DOMs. However, if a full DOM is sent to a DOM comparator (e.g., at the client, at a proxy server, etc.) after each client interaction, the comparisons may begin to degrade after few interactions since; for example, an insertion of new content affects style computation, which in turn can affect a percentage of the DOM that remains the same from one client interaction to the next.

[0027] To address this problem, a system **100** of FIG. **1** introduces the capability for temporal registration of modifications in a DOM and providing an efficient update to the DOM. In general, a more efficient method for rendering updates to a DOM can be via a web-content rendering engine where it can systematically detect changes, triggered by a user interacting with web content (e.g., a web page), in the order in which they occur. Then the output of the web-rendering engine may be communicated to a service (e.g., a proxy server) with a DOM comparator, which can determine the smallest possible change for sending to the client device. In one embodiment, the method may include for a browser rendering engine to temporally register each modification to